

# ATOMIC ENERGY

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Dear Sir:

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To make atomic power competitive with conventional power plants, a practicable breeder reactor must be developed, R. G. Lorraine, General Electric Co., recently told a committee of the Pennsylvania Electric Association, in Newark. Now, he said, interest is in extending the temperature range in breded piles to increase the thermal efficiency of heat transfer. The high thermal stresses, that result from the use of such high heat transfer rates, complicate the task of confining recirculated, and possibly radioactive coolants, in a system incorporating seals and joints that might leak, he observed.

Electrical equipment manufacturing concerns should be alert to the effect of atomic power development on their businesses, and insurance companies, banks and other investors of large business funds need a new awareness to the industrial use of the atom, David E. Lilienthal recently told a Brooklyn audience. At an earlier press conference, he said one reason industry has not been given a better chance at atomic power to date has been because of a fascination for weapon making by the Washington powers. At a Town Hall talk, in New York, he called the present system of Government monopoly of atomic energy "cockeyed". Rivalries within the U. S. Government over constructive versus military uses of nuclear energy were, he hinted, one of the drawbacks of present Government control.

President Truman turned down last week a proposal requiring at least one member of the 5-member Atomic Energy Commission to be a regular military officer. In the Washington move, Senator Tydings of Maryland, and Representative Kilday of Texas, had introduced enabling legislation simultaneously in the Senate and House, when two AEC vacancies--one actual, and one in near prospect--confront President Truman. (David E. Lilienthal resigned as AEC Chairman Feb. 15th; Lewis L. Strauss is resigning as of Apr. 15th.)

Public hearings into the state of U. S. civil defense against attack by atomic weapons are scheduled to start this week in Washington, by the Joint Congressional Committee on Atomic Energy. Spokesmen for such organizations as the Red Cross, and the American Municipal Association, will testify.

American, British, and Canadian talks in Washington on exchange of atomic information, and atomic weapons, have been suspended while the three powers individually examine the question of security. Since the last meeting in December, of these three powers, Dr. Klaus Fuchs, British nuclear physicist, has been jailed for improper disclosure of classified information. The agreement, under consideration, before this case broke, would have set up a partnership in the atomic field based on the most rational and economical joint utilization of materials, techniques, and knowledge available to the three countries.

AT THE ATOMIC CITIES AND CENTERS IN THE UNITED STATES...

OAK RIDGE, Tennessee- The present program for expansion and development of this project involves more than a quarter-billion dollars in new plant and laboratory facilities, most of which work is just getting under way. This includes two additions to the gaseous diffusion plant for separation of uranium-235 (the K-29 facility, which will cost \$67 million, and the \$162 million K-31 plant), and construction of new permanent facilities for Oak Ridge National Laboratory. Replacement of temporary, war-built housing began nearly two years ago, and \$30 million of such community improvements are currently under construction.

Investors throughout the country have been invited to submit proposals to lease land on a long-term basis, and construct and operate a proposed new central business district for this community of 33,000 people. The new area would cover about 100 acres, where approximately \$1 million of AEC funds are now being spent on site preparation, grading, etc.

Issuance of its annual report recently by Union Carbide and Carbon Corporation draws attention to operations of its subsidiary, Carbide and Carbon Chemicals Division, now enjoying the largest operating fees of any U.S. company in the atomic energy industry. Here at Oak Ridge, Carbide operates the gaseous diffusion plants (K-25 and K-27), parts of the electromagnetic plant (Y-12), and the Oak Ridge National Laboratory. Its annual fee for K-25 and K-27 is \$1,152,000.00; for Y-12 it is \$228,000.00; and for the National Laboratory, \$504,000.00. These fees are "guaranteed profits", since its contract provides that overhead expenses incurred at Oak Ridge are reimbursable by the Government, and that all work is performed at the expense of the Government.

A fellowship program to give training in radiological physics to selected college graduates with degrees in basic science or engineering will be sponsored by the AEC for the 1950-51 academic year. The Oak Ridge Institute of Nuclear Physics here will administer the program. Additional information may be secured from the Division of Biology and Medicine, AEC, Washington, 25, D.C.

ARCO, Idaho- Some of the design features of the chemical separation plant (nuclear fuel recovery and decontamination) for the nuclear reactor testing station here were outlined recently at Pocatello by Mr. Thomas Stickley, AEC reactor engineer. The plant must be designed, he said, to handle a composite of the problems faced at all other installations, since it is expected that it will process the outflow from several different types of nuclear reactors. (Under construction or scheduled for this station: A land based prototype of a reactor for propulsion of Naval vessels, and a materials testing reactor-both thermal reactors; and the experimental breeder reactor, in the fast neutron range.) Possibilities have arisen, Stickley stated, which may enable some of the processes to be incorporated into a single line, or at least have parts of the plant common to both. The negative side of this, he observed, is the problem of the experimental breeder reactor. For this reactor, a separate line may be necessary in order to calculate the breeding gain by material balances.

With activities underway here barely half a year, more than \$6 million in contracts has already been awarded. About \$15 million additional is scheduled for early letting. Involved are engineering, construction, supplies, transportation, and communication, plus the various auxiliary facilities normally associated with these jobs. In addition, basic exploration studies in geology, hydrology, and meteorology are well advanced.

RICHLAND, Washington- As the multi-million dollar expansion program here at Hanford Plutonium Works gets under way (with Atkinson-Jones Construction Co. doing the major portion of the work-AEN 1/3/50, p.2), some relief is expected by harried welfare and labor officials from the serious problems caused by an influx of some 6,000 construction workers into this area. Plans announced last Fall, when the hiring peak was announced as some 12,000, may be responsible for the unduly large group now here. Now, however, due to "changes in circumstances and technical development", the peak employment by building sub-contractors on the project has been placed at 7,200, with this figure not to be reached before August.

PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work

NUCLEAR CENTER- Exhibiting their instruments and products for nuclear work, at the Grand Central Palace Engineering Show of the Institute of Radio Engineers, held in New York Mar. 6-9, were such specialized manufacturers of nuclear instruments as: Atomic Instrument Co., Boston; Berkeley Scientific Co., Richmond, Calif.; El-Tronics, Inc., Phila.; Kelley-Koett Man. Co., Covington, Ky.; W. S. MacDonald Co., Inc., Cambridge, Mass.; National Technical Laboratories, S. Pasadena, Calif.; Nuclear Instrument & Chemical Corp., Chicago; and Victoreen Instrument Co., Cleveland.

FROM THE MANUFACTURERS- Keleket Dosimeter, Model K-111. New, smaller, self-indicating dosimeter for X-and gamma radiation detection and measurement. Will not measure alpha particles or neutrons, and has only a 50% transmission to beta rays of 0.8 Mev. Length: 3 5/8-in.--Kelley-Koett Man. Co., Instru. Div., Covington, Ky.

Model 3039, Interlocking Lead Bricks. Interlocking feature eliminates the low density "joint space" between ordinary rectangular bricks. Interlocking sections are so designed that a complete dense wall may be obtained by fitting suitably shaped bricks together. Available in four different shapes. -- Nuclear Instrument & Chemical Corp., Chicago 10.

Portable gamma-ray spectrometer, developed by Drs. R. W. Pringle, and G. M. Brownell, and Prof. K. I. Roulston, of the University of Manitoba, Winnipeg, Canada, for geological, laboratory, and medical uses (AEN 10/11/49, p.3). Tested successfully in the Lake Athabaska pitchblende district of Northern Saskatchewan last Summer. High sensitivity to gamma rays, and capable of distinguishing between gamma rays of different energies. --Halross Instruments Corp., Ltd., Winnipeg, Canada.

Model 1P21 Multiplier Phototube. Newly improved model shows a six-fold reduction in operational noise, permitting a corresponding reduction in the lower limit of measurable light intensities. In nuclear research, useful in work involving light at low levels. --Radio Corp. of America, RCA Tube Dept., Harrison, N. J.

SPECIAL NUCLEAR PLANT EQUIPMENT- A tool dolly, which its constructors say can perform every task the human hand can perform, has been developed by General Electric Co. for work in radioactive areas where high activity levels would injure humans. The dolly, which weights five tons, and moves under its own power on narrow-gauge tracks, resembles a railroad handcar with a small caliber deck gun mounted on it. The gun-like part of the apparatus is a telescoping arm, on the end of which are double clamps. The arm can be extended or shortened, raised or lowered, by remote control. (All operations of the dolly are by remote control from a shielded adjacent room.) The "hand" itself is capable of a wrist-bending motion, rotation, and gripping. Rotating devices for opening and closing valves; several specialized attachments for taking apart or reassembling specific types of machinery; and an hydraulically driven ram, electrically operated, for delivering a four-ton "push", complete the device.

BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Pocket Encyclopedia of Atomic Energy. Edited by Frank Gaynor. A collection of brief explanations and definitions of concepts and terms in the field of nuclear physics and atomic energy. Over 2,000 entries. --Philosophical Library, Inc., New York 16. (\$10.00)

Atomic Physics, by Wolfgang Finkelburg, Fort Belvoir, Va. Nuclear, atomic, molecular and solid state physics from an atomistic point of view. International series in pure and applied physics. -- McGraw-Hill Book Co., New York 18. (Now in press.)

Clinical Radiation Therapy, by Ira I. Kaplan, M.D., Clin. Prof. of Radiology, Medical College of New York University. New second edition. Covers every condition for which the author believes radiation may be effective. 859 pages. 614 illus. --Paul B. Hoeber, Inc., New York 16. (\$15.00)

SPECIAL NOTE- In its first case, the Patent Compensation Board of the AEC decided last week that patents and the application of N.P. and W.A. Fletcher were not revoked by the Atomic Energy Act of 1946, and that none of the devices and methods concerned had been used by the AEC, the Manhattan Engineer District, or their contractors. The Fletchers are joint owners of patents on "Communicating Circuits", "Light & Flower Holder", and an application. The decision, which has denied royalty fees, compensation, and any award, was made by the Board consisting of Casper W. Ooms, Chicago attorney and former U.S. Commissioner of Patents; John V. L. Hogan, New York consulting engineer; and Isaac Harter, Chairman of the Board of Babcock and Wilcox Tube Co.

TWENTY-TWO PATENTS AND APPLICATIONS, developed in the course of atomic energy work, and owned by the U. S. Government, are now available to interested manufacturers on a royalty-free (non-exclusive) basis. They supplement 67 others similarly released (AEN 2/28/50, p.1). For licenses, inquiries should be made to the Chief, Patent Branch, USAEC, Washington 25, D.C. This latest group of twenty-two comprises: Patents No. 2,431,732, Fixture to locate & weld valve parts; No. 2,441,042, Calibrating venturi tubes; No. 2,441,044, Pneumatic relay switches; No. 2,442,625, Packless valve; No. 2,446,385, Pneumatic relay adjusting device; No. 2,465,018, Cam operated valve; No. 2,466,118, Precipitating ammonium diuranate; No. 2,476,249, Remote control manipulator; No. 2,486,976, Pressure measuring device; No. 2,489,028, Positive shutoff dispensing nozzle; No. 2,490,298, Radiation detecting apparatus; No. 2,491,220, Neutron detector; No. 2,491,320, Neutron detector; No. 2,492,365, Dispensing nozzle; No. 2,493,137, Voltage doubling circuits; No. 2,493,935, High-energy neutron counter; No. 2,494,267, Surface hardening of ferrous metals. Applications No. 542,623, Photochemical chlorination of hydrocarbons; No. 565,993, Electromagnetically operated counter; No. 669,502, Production of fluorine; No. 719,525, Air proportional counter; No. 744,499, Radiation counters.

NEW U. S. PATENTS GRANTED- Apparatus to produce ions. A frusto-conical chamber has a filamentary electrode supported in its base. An ionizing potential is impressed between the filament and the chamber's walls. U.S. Pat. No. 2,498,841, issued Feb. 28th, 1950, to P. King, and assigned to the United States of America (USAEC).

Vacuum analyzer. Comprises a pair of spaced cathodes, with a gaseous region between them, and an apertured, tubular anode axially aligned with, spaced from, and intermediate the cathodes. U. S. Pat. No. 2,499,288, issued Feb. 28th, 1950, to J. G. Backus, and assigned to the United States of America (USAEC).

Neutron detection apparatus by use of two proportional counters at different distances from a neutron source, with a higher actuating voltage across the counter remote from the source, than that applied to the counter near the source. U.S. Pat. No. 2,499,311, issued Feb. 28th, 1950 to G. Herzog, and assigned to the Texas Company, New York.

Exploring for radioactive bodies. Aerial detection of radioactive material (gamma-ray emitting), by using an airborne ionization chamber. The ionization chamber is shielded from alpha particles, and the effect upon it of cosmic radiation is determined. A low rate of speed of the aircraft carrying the chamber enables proper observations to be made. U. S. Pat. No. 2,499,489, issued Mar. 7th, 1950, to L. Goldstein and Boris Pregel, and assigned to Canadian Radium and Uranium Corp., New York.

#### PEOPLE...in the atomic energy industry...

Lindsley H. Noble has been appointed Controller of the U. S. Atomic Energy Commission. He succeeds Paul M. Green, who resigned in December, 1949.

W. P. Cornelius, who has headed the construction division of the AEC at Hanford Plutonium Works since August 1947, has resigned and will open a new office in Houston, Texas, for Giffels & Vallet, architectural firm.

John A. Derry is the new Executive Officer of the AEC Division of Biology and Medicine. He will directly supervise Civil Defense Planning, Radiation Instruments, and other branches.



### RADIOISOTOPES...latest tracer applications...

Radioactive bromine (bromine-82) was used to prepare dibromoprocaine-HCl (DBP) labeled with the Br-82. Frank Howarth, at the University of Manchester (England), used this tagged spinal anaesthetic to make detailed studies of its distribution in various parts of the spinal cord. Among his conclusions were that the drug entered the spinal cord by a route other than the blood stream, and that the chief route by which DBP was removed from the spinal theca was the venous system.

In another use of Br-82, methyl bromide was labeled with the isotope and used to determine minute traces of fumigants and other insecticides present in treated foodstuffs and in insects. In one phase of this work, which was done under the Director of Pest Infestation Research, DSIR (England), the electrometric method was used for determining small methyl bromide residues in tobacco. (Normally, this method is handicapped by the presence of considerable quantities of natural bromide and chloride.) To locate the labeled methyl bromide taken up by insects exposed to the vapor, radioautographs were used.

Using sulphur-35 labeled methionine, metabolism studies have been made by Kinsell, Margen, Tarver, Frantz, et al., at the University of California, San Francisco and Berkeley, and at the U. S. Naval Hospital, Oakland. They found that the incorporation of this material into plasma proteins in normal individuals occurs at a predictable rate. This, plus other findings, led them to conclude that S-35 labeled methionine can be used safely in the human subject for investigative purposes.

### IONIZING RADIATION...investigations & notes...

A report of a human fetus subjected to large doses of roentgen rays without apparent damage has been made by A. A. Hobbs, Jr., M. D., of Evansville, Ind. A dose of 1,500 r, measured in air, was administered (for a bone lesion), to a mother of six, who was pregnant. The calculated mid-pelvic depth dose was 900 r. Three months later, additional radiation added 375 r at the center of the pelvis. A month after the last irradiation, a male child was delivered, by cesarean section. (The mother died a year later.) The child is of interest because of the large dose of roentgen rays it received during its 5th fetal month. At birth, he weighed 6½-pounds, and no physical defects were found. Lower incisors appeared at 5½ months, followed at normal sequence by upper incisors and molars. He began speaking when 19 months old. According to his parent, at the child's 4th birthday, he does not seem abnormal or unusual--the parent had been warned to expect abnormalities as a result of the prenatal irradiation.

The destructive action of radioactive astatine-211 (element 85) on the thyroid gland of the rat has been studied by Hamilton, Asling, Garrison, Scott and Axelrod-Heller, at the University of California, Berkeley and San Francisco. The studies were prompted by the fact that astatine (half-life, 7.5 hrs.) had been shown to accumulate in the thyroid, similarly to radioiodine, and might offer advantages over the radioiodine for therapy. Astatine, the experimenters note, is unlike most of the artificial radioelements in that it emits alpha particles rather than electrons and gamma rays. These alpha particles will dissipate an initial kinetic energy of 6 Mev in about 50 microns of soft tissue such as the thyroid. This contrasts with the beta rays from the 8-day iodine (I-131) which possess a maximum energy of 0.6 Mev with a range of nearly 2,000 microns of tissue. In the preliminary thyroid uptake tests of astatine made on rats, results showed that astatine has the capacity to induce an extreme degree of radiation injury of the thyroid gland of the rat, without apparent involvement of the adjoining para-thyroid gland.

Sincerely,

The Staff,  
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